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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/557,628	11/17/2005	Pim Theo Tuyls	NL030552	4463
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EXAMINER SIMS, JING F				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/557,628

Applicant(s)

TUYLS ET AL.

Examiner

JING SIMS

Art Unit

4148

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) 2-13, 15, 17 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/17/2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. The instant application having Application No. 10557628 filed on November 17, 2005 is presented for examination by the examiner.

Oath/Declaration

2. The applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in **37 C.F.R. 1.63**.

Priority

3. As required by **M.P.E.P. 201.14(c)**, acknowledgement is made of applicant's claim for priority based on applications filed on May 21, 2003 (European Patent Office (EPO) 03101453.3).

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

4. The applicant's drawings submitted are acceptable for examination purposes.

Specification

5. Applicant is reminded of the proper layout for specification. The following guidelines illustrate the preferred layout for a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

6. The specification is objected to because of the following informalities: misspelling of the word "enrollment", for example: page 1 line 13; page 2 line 13; page 6 line 17, so forth.

Appropriate correction is required.

Claim Objections

7. Claims 2-13, and 15 are objected to because the claims recite "A method" which refers to the method in claim 1. The proper form should be "The method".

8. Claim 17 is objected to under 37 CFR 1.73 Reference to drawings because of the incorrect reference number "the authentication device (120)" on page 23, line 25. The authentication device (120) has not presented in the drawings. Appropriate correction is required.

9. Claims 17 and 18 are objected to because the claims include reference numbers, such as "A system (100)", "a physical object (105)" in claim 17. Claims generally do not include reference numbers from drawings. The deletion of the reference numbers is required.

10. Claim 18 is objected to because of the following informalities:

Claim 18 is a dependent claim of claim 17. A dependent claim should be further limiting the independent claim; however, claim 18, as a whole, is identical to claim 17 from page 23, line 25 to page 24, line 2. Therefore, claim 18 does not further limit claim 17. Appropriate correction is required.

Claim Rejections - 35 USC § 101

11. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

SOFTWARE PER SE

12. **Claims 14 and 16** are rejected under 35 U.S.C. 101 as directed to non-statutory subject matter of software, *per se*. The claims lack the necessary physical articles or objects to constitute a machine or manufacture within the meaning of 35 U.S.C. 101. It is clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of

matter. As such, they fail to fall within a statutory category. It is at best, function descriptive material *per se*.

13. Descriptive material can be characterized as either “functional descriptive material” or “nonfunctional descriptive material.” Both types of “descriptive material” are non-statutory when claimed as descriptive material *per se*, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994).

14. Merely claiming non-functional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an electromagnetic carrier signal, does not make it statutory. See *Diehr*, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in *Benson* were unpatentable as abstract ideas because “[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer.”).

As per claim 14, applicant has claimed a “a computer program product” to cause a processor to “perform” the method of claim 1, and per claim 16, applicant has claimed a “computer program product” operative to cause a processor to “perform” the method of claim 15; per this implies that applicant is claiming a system of software, *per se*, lacking the hardware necessary to realize any of the underlying functionality. Therefore, claim 14 and 16 are directed to non-statutory subject matter as computer programs, *per se*, i.e. the descriptions or expressions of the programs, are not physical “things.” They are neither computer components nor statutory processes, as they are not “acts” being performed. Such claimed computer programs do not

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define any structural and functional interrelationships between the computer program and other claimed elements of a computer, which permit the computer program's functionality to be realized.

Furthermore, applicant has claimed a computer program "product" to cause perform a "method" indicates claim 14 and 16 are hybrid claims of a product claim and a process claim. A claim can only be either a product claim or process claim, not both.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

15. Claims 14 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly define and distinctly claim the subject matter which applicant regards as the invention.

Claims 14 and 16 recite the limitation "a computer program product" on page 22, line 14 and page 23, line 16, however, applicant does not define the term "a computer program product" in specification; therefore, "a computer program product" has no support in the specification for this limitation in claims 14 and 16.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. **Claim 1 -6, 15, 17 and 18** are rejected under 35 U.S.C 102(b) as being anticipated by Yamaguchi et al (US 6314196) (hereinafter Yamaguchi)

As per **Claim 1**, Yamaguchi discloses "A method of generating authentication data for authenticating a physical object; the method including:" (Column 1, line 7-8, "a fingerprint registering method for registering a fingerprint" which has the same meaning of "generating authentication data", and column 1, line 32-33 "to authenticate personal identification") "measuring a property set Y of the object using a measurement procedure;" (Figure 1, reference number 1, Yamaguchi discloses this limitation as "Fingerprint image pickup unit" a fingerprint image is property set, and the pickup unit certainly performing a measurement procedure to pickup the fingerprint.) "creating a property set I from the measured property set Y that meet a predetermined robustness criterion" (Figure 1, reference number 2, with respect to this limitation, Yamaguchi discloses "image processor unit" it includes "binarized image converting unit" which is to creating a property set from the measured project in this case a fingerprint, also "In registering a fingerprint, a prescribed number or more of minutiae are required" (Column 11, line 34-38), is an example of "a predetermined robustness criterion") "creating a property set A from the property set I that includes less information on the actual properties than property set Y" (Figure 3, reference B4 and B5, also Column 36, line 24-37 Yamaguchi discloses as "the multivalued image data which is through the spatial filtering" "and thinning processing, extraction of minutiae and deletion of pseudo minutiae are performed in steps(8) to (10), by going through the spatial filtering, thinning process, and extracting minutiae which including deleted pseudo minutiae, the generated data/property set certainly includes less information than

previous data/property set”) “generating a control value V in dependence on properties of property set A and inserting the control value in the authentication data” (Figure 1, reference number 4 or figure 3 reference number B6, this limitation is disclosed by Yamaguchi as “Extract normal minutiae for registering”. The extracted normal minutiae has equal meaning as control value V. Both of the values are authentication data that used to represent the measured physical object, which in Yamaguchi, fingerprint or fingerprints).

As per **Claim 2**, Yamaguchi discloses “A method as claimed in claim 1, where in the step of creating the property set A includes performing a contracting transformation” (Figure 3, reference number B4, Yamaguchi discloses as “Extract minutiae”. Since contracting transformation can be interpreted very broad, the process of “extracting minutiae” is a to transform a biometric data – for example a fingerprint - from one state to the other state by performing “extract minutiae”).

As per **Claim 3**, Yamaguchi discloses “A method as claimed in claim 1, wherein the contracting transformation transforms a property to a binary number representative of a sign of the property” (Figure 17, reference number A8, and Column 29, line 7-8 “the content d at the n-th byte of the registered fingerprint data is stored in the register (A8)” Yamaguchi discloses the content in “byte”, it is the length unit used by binary numbers, therefore, “a property” is represented by binary numbers)

As per **Claim 4**, Yamaguchi discloses “A method as claimed in claim 1, wherein the step of creating the property set A includes selecting a subset of the property set I” (Column 4, line 27-30 and line 52-61, Yamaguchi discloses an self-explanatory diagram in Figure 36, Yamaguchi also explains “dividing a pictured image into blocks, and when 512.times.512 picture

elements are determined as one screen, division into 1024 blocks is made with 16 times 16 picture elements as one block"; therefore, the blocks have the equal meaning with "subsets" in the instant application. Yamaguchi further discloses "selecting a subset" as in Figure 38, and give the example of "the flowchart of a conventional example" It is an actually selecting process of subsets in Yamaguchi's application).

As per Claim 5, Yamaguchi discloses "A method as claimed in claim 4, including creating helper data W for controlling the selection of the subset and inserting the helper data W in the authentication data" (Column 4, line 27-33, and line 52-61, Figure 36 is an self-explanatory diagram of dividing a pictured image into blocks, the subset has been described as blocks "in which a block number is initialized with $m=1$ (B-1). In other words, number m for 1 to 1024 is allocated with respect to 1024 blocks in the image shown in FIG. 36, and the block number m is determined as 1 for initialization. Then, with $n=1$ (B2), the picture element number n in the block is initialized. In other words, the number n for 256 picture elements in the image shown in FIG. 36 is allocated, and this picture element number n is determined as 1 for initialization." Basically, Yamaguchi discloses the "helper data" in this application appears to be m or n, or m and n. M and n controls the selection of the subsets which are the divided image blocks. Thereby limit the range of parameters (finger print pattern) which is the definition of helper data.).

As per Claim 6, Yamaguchi discloses "A method as claimed in claim 5, including creating unique helper data W for respective authentication applications" (Column 3, line 57-67, Yamaguchi discloses "based on the multivalued image, it is judged by the fingerprinting judging unit 313" "division into respective blocks is made". Yamaguchi discloses earlier "block number

m and picture element number n", so m is block number. It indicates from above statements that the block number m is based on the multivalued image. The multivalued image is generated upon the fingerprint by the fingerprint image pickup unit 311. Therefore, the block number m is uniquely created respect to each authentication applications.).

As per Claim 15, Yamaguchi discloses "A method of authenticating a physical object; the method including: measuring a property set Y of the object using a measurement procedure; creating a property set I from the measured property set Y that meet a predetermined robustness criterion; creating a property set A from the property set I that includes less information on the actual properties than property set Y; generating a control value V' in dependence on properties of the property set A," this limitation is identical to a method of generating authentication data in claim 1. To avoid redundancy, all the rejection for claim 1 is also apply to claim 15. "retrieving a control value V that has been generated for the physical object during an enrolment; and authenticating the physical object if there is a predetermined correspondence between the generating a control value V' and the retrieved control value V". (Column 30, line 25-35, Yamaguchi discloses the process in Fig. 20 flowchart of registering of the register "first fingerprint" in reference number A2, and by authenticating the physical object by "match" in reference number A5. "The first fingerprinting is effected" means the process of retrieving a control value V. "A predetermined correspondence" are explained as "to judge whether or not they match" in Yamaguchi's application. Applicant discloses "The authentication may in principle be done using the same apparatus as used for the enrollment" in specification. The Fig. 20 in Yamaguchi's application is the example of this model. All limits in Claim 15 are taught in the prior art).

As per Claim 17, Yamaguchi discloses "A system (100) for authenticating a physical object (105);" (Column 17, line 3-4, Yamaguchi discloses "the embodiment of a fingerprint checking device") "the system including an enrolment device (110)" (Figure 1, reference number 1 Yamaguchi discloses as "image pickup unit") "an authentication device (140)" (Figure 1, reference number 1, Yamaguchi discloses as "image pickup unit". the specification of the instant application discloses that the authentication may in principle be done using the same apparatus as used for the enrollment, therefore, authentication device also can be "image pickup unit") "and a storage (130) for storing authentication data" (Figure 1, reference unit 6, Yamaguchi discloses as "registering unit", it also can be find in Figure 20, reference number A3, Yamaguchi discloses as "Temporary fingerprint registering") "the enrolment device (110) including: an input (112) for receiving a property set Y of the object measured using a measurement procedure" (Figure 1, reference number 1, Yamaguchi discloses as "Fingerprint image pickup unit") "a processor (114) for creating a property set I from the measured property set Y that meet a predetermined robustness criterion, creating a property set A from the property set I that includes less information on the actual properties than property set Y, and generating a control value V in dependence on properties of the property set A" (Figure 1 reference number 2-4, Yamaguchi discloses as "Image processor unit", minutia detecting unit and average pseudo minutia calculating unit), "an output (116) for supplying the control value to the storage as part of the authentication data" (Figure 1, reference number 4, average pseudo minutia calculating unit, it also show in Figure 3, reference number B9, Calculate the number of average pseudo minutiae. As in rejection for claim 1, in Yamaguchi's application the extracted normal minutiae has equal meaning as control value V, therefore the corresponding device is average pseudo minutia

calculating unit) “the authentication device (140) including: an input (142) for receiving a property set Y of the object measured using a measurement procedure and for receiving a control value V from the storage; a processor (144) for creating a property set I from the measured property set Y that meet a predetermined robustness criterion; for creating a property set A from the property set I that includes less information on the actual properties than property set Y; for generating a control value V' in dependence on properties of the property set A; and for authenticating the physical object if there is a predetermined correspondence between the generating a control value V' and the retrieved control value V” (Figure 1, reference number 1, Yamaguchi discloses as “Fingerprint image pickup unit”, the specification of the instant application discloses that the authentication may in principle be done using the same apparatus as used for the enrollment, therefore, authentication device also can be “image pickup unit”) “and an output (146) for issuing a signal indicating whether or not the physical object has been authenticated.” (Figure 1 reference 5, Yamaguchi discloses this limitation by “judging unit”).

As per Claim 18, since it is identical to claim 17 [see the description in claim objections, paragraph 11] the rejection is same as the portion that identical to claim 17. See the rejection for claim 17 above.

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi (US 6314196) in view of Bjorn (US 6035398).

As per claim 12, Yamaguchi discloses “A method as claimed in claim 1, wherein the step of creating the control value V” [See rejection to claim 1 above], but fails to disclose “includes performing a cryptographic function on properties of the property set A”.

However, Bjorn discloses “performing a cryptographic function on properties of the property set A.” (Column 4, line 25-37, and Figure 3 reference number 325 Hash template to create cryptographic key, at block 325, “the template is hashed. For one embodiment, this hash is the cryptographic key. For another embodiment, known techniques are used on the hash to generate the cryptographic key. This cryptographic key is identified with the specific fingerprint, and thus with a specific user”).

Yamaguchi and Bjorn are analogous art because they are from the same field of using biometric data to enhance authentication process.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Yamaguchi to apply the one-way hash function of Bjorn because it would provide to generate a cryptographic key to enhance the security of control value V in Yamaguchi for the authentication.

As per claim 13, Bjorn discloses claim 13 “the cryptographic function is a one-way function.” (Column 4, line 25-37, and Figure 3 reference number 325 Hash template to create cryptographic key, at block 325, “the template is hashed. For one embodiment, this hash is the cryptographic key. For another embodiment, known techniques are used on the hash to generate

the cryptographic key. This cryptographic key is identified with the specific fingerprint, and thus with a specific user.”).

20. Claims 7, 9, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over anticipated by Yamaguchi (US 2001/6314196), in view of Kenmore et al. (US 5799098) (hereinafter Kenmore).

As per claim 7, Yamaguchi discloses “A method as described in claim 1”, but fails to disclose “wherein the predetermined robustness criterion is based on a signal to noise ratio of the measured properties and the step of creating the property set I includes performing a transformation .GAMMA. on the property set Y to create disjunct property sets I.sub.1 and I.sub.2 where a signal to noise ratio of properties of I.sub.1 are estimated to be higher than a signal to noise ratio of properties of I.sub.2; and using I.sub.1 as the property set I.”

However, Kenmore discloses “A method as described in claim 1”, but fails to disclose “wherein the predetermined robustness criterion is based on a signal to noise ratio of the measured properties and the step of creating the property set I includes performing a transformation .GAMMA. on the property set Y to create disjunct property sets I.sub.1 and I.sub.2 where a signal to noise ratio of properties of I.sub.1 are estimated to be higher than a signal to noise ratio of properties of I.sub.2; and using I.sub.1 as the property set I.” (Column 14, line 29-41, Kenmore uses “filter 110” and “filter 120” to serve the functionalities of transformation Γ. “The disjunct property set I.sub.1 and I.sub.2” are described as the output data I.sub.FSCE after the process of contrast enhancement in Figure 7 reference number 120 and the output data I.sub. FS after the process of low pass filter (Figure 7 reference number 110

respectively. It is obvious for one skilled in the art to observe that I.sub.FSCE has higher Signal to noise ratio than the output data I.sub. FS after the process of low pass filter in Figure 7 reference 110 and the purpose of this transformation is to produce a higher signal to noise ratio.)

Yamaguchi and Kenmore are analogous art because they are from the same field of using biometric data, which is fingerprint in these two applications to enhance the image of fingerprint quality by eliminating the noise to get a higher signal to noise ratio.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Yamaguchi to use the low filter and contrast enhancement of Kenmore because it would provide to enforce the robust criterion, then to further consolidate the security of the system by applying the techniques to lessen the contained information in Yamaguchi.

As per Claim 9, Kenmore discloses "A method as claimed in claim 7, including the step of creating the transformation .GAMMA. Independence on a statistical property of the measurement procedure." (Column 14, line 28-41 Kenmore discloses the statistical property in the term of "high frequency noise". The high frequency noise data is obviously generated during the measurement procedure.)

As per Claim 10, Kenmore discloses "A method as claimed in claim 9, wherein the statistical property includes a covariance matrix derived from estimated properties X of the object and a corresponding statistical distribution F." (Column 14, line 20-41, Kenmore discloses estimated properties X to be "ridge angle", and corresponding statistical distribution F appears to be "an 800 by 800 pixel image". It is obvious for one skilled in the art that both of the data sets are represented by matrices).

As per **Claim 11**, Kenmore discloses "A method as claimed in claim 7, including deriving a threshold from a noise level in the measured property set and assigning created properties with an absolute value larger than the threshold to set $L_{sub.1}$." (Column 29, line 43-50, with respect to this limitation, Kenmore discloses "The 256 cells of $Q_{sub.coarse}$ are filled by sequentially considering the data within each of 256 16×16 cell submatrices of $Q_{sub.smooth}$ that in total comprise all the cells of it. Each of the 16 cells within a submatrix are examined to determine if the stored cell value is below a fixed poor quality threshold. If 75% of the cells are below a quality of 0.5 for $Q_{sub.coarse}$, then the cell is dubbed as poor quality. If 75% (12 cells) are below the threshold then: the corresponding $Q_{sub.coarse}(i,j)$ is set to 0; otherwise $Q_{sub.coarse}(i,j)$ is set to 1." Kenmore discloses the same concept of deriving a threshold from the percentage of measured property set by using the term " $Q_{sub.coarse}$ ").

21. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi (US 2001/6314196) in view of Kenmore et al. (US 5799098) (hereinafter Kenmore), and further in view of Vizcaya (Pedro Vizcaya, A personnel identity verification method using DAB fingerprints (Pattern recognition), 1998)

As per **Claim 8**, Yamaguchi and Kenmore disclose a method as claimed in claim 7 but do not specifically teach wherein the transformation $GAMMA$ is a linear transformation that converts a vector representing the property set Y to a vector with components as representing the set I , where each vector component $\alpha_{sub.i}$ is independent of the other vector components $\alpha_{sub.j}$ ($j \neq i$) and wherein the vector components are sorted according to an estimated signal to noise ratio.

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However, Vizcaya discloses “a linear transformation” (Page ix, line 19-23, “a linear transformation” by “since model is linear, its parameters are efficiently calculated using standard linear transform techniques. Additionally, the model allows the evaluation of the specific contribution of each singularity to explain the ridge orientation everywhere.”) “that converts a vector representing the property set Y to a vector with components as representing the set I, where each vector component α_{ij} is independent of the other vector components α_{jk} (j.noteq.i) and wherein the vector components are sorted according to an estimated signal to noise ratio” Using independent vectors with sorted order to represent a physical object (i.e. property set) is well known and expected in the art.

Yamaguchi, Kenmore, and Vizcaya are all analogous art because they are all from the same field of enhancing the biometric data, which in these three cases specifically fingerprints, by extracting the key feature to get a higher signal to noise ratio, to authenticate an access.

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It would have been obvious to one of ordinary skill in the art at the invention time to modify the teaching of Yamaguchi for applying the linear transformation algorithm of Vizcaya because it would provide for the transformation of a vector to the other vectors in more rapid fashion, therefore, to shorten the authentication processing time.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JING SIMS whose telephone number is (571)270-7315. The examiner can normally be reached on 7:30am-5:00pm EST, Mon-Thu.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Pham can be reached on (572)272-3689. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

August 15, 2008

Jing Sims

/J. S./

Examiner, Art Unit 4148

/THOMAS PHAM/
Supervisory Patent Examiner, Art Unit 4148